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On the butterflies of genus *Precis* Hübner, 1819 known in Angola, with description of a new species (Lepidoptera: Nymphalidae, Nymphalinae)

L. F. Mendes, A. Bivar-de-Sousa, S. Vasconcelos & L. F. Lopes

Abstract

Angolan samples of butterflies of genus *Precis* Hübner, 1819 are studied. One new species, *P. larseni* Mendes, Bivar-de-Sousa, Vasconcelos & Lopes, sp. n., is described from the Moxico, Cuanza Norte and Huambo provinces. *P. rauana* is reported as a faunistic novelty to the country based on specimens from the Uige province. New data are presented relatively to the remaining species of the genus already known for Angola.
KEY WORDS: Lepidoptera, Nymphalidae, Nymphalinae, *Precis*, new species, faunistic, new data, Angola.

Sobre las mariposas del genero *Precis* Hübner, 1819 conocidas en Angola y descripción de una nueva especie (Lepidoptera: Nymphalidae, Nymphalinae)

Resumen

Se estudian unas muestras de mariposas angolanas del género *Precis* Hübner, 1819. Se describe una especie nueva, *P. larseni* Mendes, Bivar-de-Sousa, Vasconcelos & Lopes, sp. n., de las provincias de Moxico, Cuanza Norte y Huambo. Se apunta *P. rauana* como una novedad faunística para el país basándose en ejemplares de la provincia de Uige. Se presentan nuevos datos con relación a las otras especies del género ya conocidas de Angola.
PALABRAS CLAVE: Lepidoptera, Nymphalidae, Nymphalinae, *Precis*, nueva especie, faunística, nuevos datos, Angola.

Sobre as borboletas do género *Precis* Hübner, 1819 conhecidas em Angola e descrição de uma espécie nova (Lepidoptera: Nymphalidae, Nymphalinae)

Resumo

Estudam-se amostras angolanas de borboletas do género *Precis* Hübner, 1819. Descreve-se uma espécie nova, *P. larseni* Mendes, Bivar-de-Sousa, Vasconcelos & Lopes sp. n. das províncias do Moxico, Cuanza Norte e Huambo. *P. rauana* é referida como uma novidade faunística com base em exemplares da província do Uige. Apresentam-se novos dados relativos às outras espécies do género já conhecidas de Angola.
PALAVRAS CHAVE: Lepidoptera, Nymphalidae, Nymphalinae, *Precis*, espécie nova, faunística, novos dados, Angola.

Introduction

Butterflies of the genus *Precis* Hübner, 1819 - the Commodores - occur exclusively in Africa and after WILLIAMS (2007b) 14 species are today known in the Afrotropical and 2 in the Madagascan Region - he reinforces the *incerta sedis* status of *Precis permagna* Martin, 1920, described from

Celebes, and notes that, if valid, it will correspond to a species of *Junonia*. Indeed, *Precis* and *Junonia* Hübner, 1819 were for long and by several authors (KIELLAND, 1970; D'ABRERA, 2004) considered synonymous but LARSEN (2005) and WILLIAMS (2007a) among others stress they differ in the male genitalia, in the caterpillars host-plants, in the geographical distribution, and in the existence of seasonal forms: *Junonia* extends to almost all the Zoogeographic Regions except for Antarctica, while *Precis* is restricted to Africa. *Junonia* caterpillars feed mostly on Acanthaceae though their known host-plants belong to ca twenty Dicotyledonous different families, but *Precis* caterpillars feed almost exclusively on Lamiaceae. And, opposite to *Junonia*, most of the *Precis* species are strongly seasonally dimorphic with dry season forms (DSF) and usually very different wet season forms (WSF); these later ones are often active on hilltops while the DSF rest on rocks or on protected banks - in populated places, even in building eaves - where they may diapause for as much as half a year. Further, WAHLBERG *et al.* (2005) demonstrate the complete independence of the two genera under the genetic point of view.

Besides the description of one new species from the Moxico, Cuanza Norte and Huambo provinces, and the reference of *P. rauana* as a faunistic novelty from Angola, in the Uige, the present contribution deals with the study of several other samples of *Precis* species already known for Angola which were obtained in almost all its provinces, what in many cases substantially enlarges their previous known range in the country, viz.: Bengo, Benguela, Bié, Huambo, Huila, Cuando-Cubango, Cuanza Norte, Cuanza Sul, Luanda, Lunda Norte, Lunda Sul, Malanje, Moxico and Uige, as well as the Cabinda Territory. The faunistic novelty and the new species described ahead added to the eight species of *Precis* previously known for Angola, increase to ten the number of taxa known in the country, what corresponds to ca 70 % of all the species of the genus currently noticed for continental sub-Saharan Africa.

Material and methods

The ca 400 *Precis* specimens studied are in their majority deposited in the Lisbon University' National Museum of Natural History and Science (MUHNAC in the text), which today stores several zoological collections till now dispersed, as follows: of the Centro de Zoologia - Instituto de Investigação Científica Tropical (CZ), extinct in 2016; of the second co-author (BS); of J. Passos de Carvalho (PC); of Carneiro Mendes (CM, long ago acquired by the CZ); of Pessoa Guerreiro (PG) offered also to the CZ; and of Mário Macedo (MM) offered to the MUHNAC. Two further collections were also studied, namely that of António Figueira (AF), now in the Oporto University' Natural History Museum, and the private collection of Nozolino de Azevedo (NA), not deposited in any institution. All the lepidopterological series hitherto deposited in the Zoological and Anthropological / Bocage' Museum (MB), the "ancestor" of the zoological part of the MUHNAC, were lost during the 28th March 1978 fire that almost completely burned its assets, most of them prior to any study could be performed.

The names of the localities presented ahead are those that were originally assigned to each species and the registration numbers are the original ones of the collections they integrate previous to their deposit in the MUHNAC.

The following abbreviations will appear also along the text: AS+RC - Collected by Artur Serrano and Ruben Capela; CDA: Offered to the CZ by the Dundo Museum, Companhia dos Diamantes de Angola (before, Diamang), Lunda; DRC: Democratic Republic of Congo, former Zaire; E - East, Eastern; EAU - Collected by the Missão de Estudos Apícolas do Ultramar of the CZ; ex - unsexed specimen; FW - Forewing; HW - Hindwing; M_1, M_2 and M_3 - First, second and third median veins; N - North, Northern; nn - not numbered sample; S - South, Southern; SE - South-eastern; SW - South-western; W - West, Western; WL - Forewing length.

The WL is measured along the FW costa from its apex to the anterior wing insertion in the thorax.

The samples reported by MONARD (1956), as in the La Chaux-de-Fonds Museum, near Neuchatel, Switzerland were not re-examined; they were collected by the Swiss Scientific Missions

(1928-1929 and 1932-1933) coordinated by himself. The same must be stated about the collection studied by LADEIRO (1956), deposited in the Coimbra' University Science Museum, Portugal.

BACELAR (1958b) assigns the samples she studied were deposited in the MB and noted as "Western Portuguese Africa"; they are reported as obtained by José de Anchieta and Francisco Newton but this last collector developed his field-work especially in the Guinea Gulf Islands; since only two *Precis* species are known in São Tomé e Príncipe, we assumed that the remaining data concern Angolan unknown localities; if still existed the 1978, none of them "survived" the MB fire. For true, the two first co-authors of the present contribution were already linked to the MB that year, and no information was retained about any African *Precis* samples.

The Cabinda collection said to be deposited (BACELAR, 1958a) in the Forest Service of Angola (in Luanda?) and that of the Bié, reported to be (BACELAR, 1961) in the São Bento College-Lyceum in Luso, Moxico are considered lost as none recent data confirms its present existence; so, none data could be rectified.

In 1995 and 2013 no insect series included the Angolan Natural History Museum collection, in Luanda, visited then by the senior co-author.

None contribution is known, further, relatively to the Nymphalidae specimens deposited in the Dundo Museum (Lunda Norte) as the only paper produced on the Angolan butterflies preserved in this institution is that of CARVALHO (1962), and deals exclusively with the Papilionidae. The second co-author visited this museum in 1965 and the first one integrated a zoological mission to this institution in 1995 but the time revealed too short to any precise analyses of the lepidopterans series; the collections were, then, in good condition. Recent information points to this institution clear recuperation but no details are known concerning its entomological collection. None of the authors had the chance to visit the other large entomological collection known to exist in Angola, that of the Huambo's Agronomical Institute (the Instituto de Investigação Agronómica de Angola, IIAA) maintained mainly by J. Passos de Carvalho during colonial times; recent news about its current condition, communicated by Luis Ceríaco, informed that it remains in quite good condition.

Most of the known host-plants references are based in WILLIAMS (2007b) and SAVELA (2010).

The administrative provinces and the approximate coordinates of the localities where or close to which the studied and the previously reported *Precis* specimens were collected, are alphabetically ordered in Table 1 based in CRAWFORD-CABRAL & MESQUITELA (1986), MENDES *et al.* (2013) and in the JIU/GGA (1948-1963a, b) maps.

Table I.– Administrative provinces and approximate coordinates of the Angolan localities from where or close to which *Precis* samples were studied in the present contribution and previously reported - Long: Longitude; Lat: Latitude; Alt: Altitude in meters above sea level; Map: Number of the aerophotogrammetric maps of Angola, scale 1:100 000 (see MENDES *et al*., 2013). Localities which names were modified after independence - recovered name - or incorrectly spelt are set out for their actual denomination as: "See: …". The "Four corners area", from where GARDINER (2004) registers several species corresponds to a region in the extreme SE Cuando-Cubango and so, no precise coordinates can be pointed. The Bulla mission was impossible to trace, as it is neither considered in the USBGN (1956), nor in the recent lists of collecting localities in Angola (CRAWFORD-CABRAL & MESQUITELA, 1986; MENDES *et al.*, 2013), nor even in the JIU/GGA (1948-1963a, b) maps, though it shall be SE of the Lucusse town. Otherwise, "Malanje / Rio Cuanza" corresponds to an immense fluvial corridor since the river is the NW limit of the Kwanza Norte province, it crosses N to SE the Malanje province, and constitutes its S limit with the Bié, along ca 500 km. so it remains impossible to locate accurately; the same must be considered relatively to the "Malanje / Rio Lucala", while probably close to the Lucala town.

Locality	Province	Long.	Lat.	Alt.	Map
Amboiva	Cuanza Sul	11º 32' S	14º 44' E	1250	208
Béu	Uige	06º 14' S	15º 29' E	900	23
Bimbe	Huambo	11º 49' S	15º 59' E	1780	210
Bimbi	See: Bimbe	—	—	—	—
Buco Zau	Cabinda	04º 46' S	12º 34' E	50	3

Bulla (mission)	Moxico	?	?	?	?
Caala	Huambo	12º 51’ S	15º 33’ E	1750	256
Calombe / Luso	Moxico	11º 50’ S	19º 55’ E	1360	218
Calulo	Cuanza Sul	09º 59’ S	14º 54’ E	990	128
Caluquembe	Huila	13º 47’ S	14º 41’ E	1700	297
Cameia	Moxico	11º 43’ S	20º 48’ E	1140	220
Camenhe	Huambo	13º 17’ S	15º 27’ E	1750	279
Ceilunga	Bié	12º 17’ S	17º 01’ E	1690	235
Cela	Cuanza Sul	11º 22’ S	15º 07’ E	1330	187
Chiaca	Cabinda	04º 52’ S	12º 34’ E	120	3
Chianga	Huambo	12º 44’ S	15º 50’ E	1740	256
Chilunda	Huila	14º 28’ S	15º 30’ E	1450	320
(Roça) Chitonde	Cuanza Sul	11º 46’ S	14º 07’ E	900	207
Cristo Rei, Lubango	Huila	14º 56’ S	13º 31’ E	2100	336
Cubango	Huila	14º 23’ S	16º 17’ E	1450	321
Cuima	See: Quima	—	—	—	—
Cuíto	Bié	12º 23’ S	16º 57’ E	1450	234
Cunjo to Amboiva	Cuanza Sul	11º 25’ S	14º 45’ E	1700	186
Dalatando	Cuanza Norte	09º 18’ S	14º 55’ E	790	110
Damba	Uige	06º 40’ S	15º 08’ E	1110	33
Dongo	Huila	14º 36’ S	15º 43’ E	1460	340
Dundo	Lunda Norte	07º 22’ S	20º 50’ E	1470	51
Ebanga	Benguela	12º 44’ S	14º 44’ E	1350	254
Elendé	Huambo	12º 44’ S	15º 09’ E	1700	255
Estação Zootécnica	Huila	14º 55’ S	13º 16’ E	2280	335
Four corners area	Cuando-Cubango	?	?	?	?
Funda	Luanda	08º 50’ S	13º 33’ E	<50	90
Ganda	Benguela	13º 02’ S	14º 38’ E	1260	278
Golungo Alto	Cuanza Norte	09º 08’ S	14º 46’ E	630	110
Henrique de Carvalho	See: Saurimo	—	—	—	—
Huambo	Huambo	12º 46’ S	15º 44’ E	1650	256
Humpata	Huila	15º 01’ S	13º 23’ E	1940	355
Kalukembé	See: Caluquembe	—	—	—	—
Kinglês	Malanje	09º 23’ S	16º 07’ E	1120	113
(Fazenda) Klein	Cuanza Sul	10º 02’ S	14º 54’ E	1040	147
Kuvangu	See: Cubango	—	—	—	—
Lago Dilolo	Moxico	11º 30’ S	22º 01’ E	1100	223
Lago Muginatema	Moxico	11º 47’ S	23º 38’ E	1260	226
Lago 28 de Maio	See: L. Muginatema	—	—	—	—
Lagoa do Gima	Cabinda	05º 20’ S	12º 20’ E	120	5
Longa	Cuando-Cubango	14º 36’ S	18º 29’ E	1380	345
Luau	Moxico	10º 42’ S	22º 14’ E	1100	180
Luena	Moxico	11º 47’ S	19º 55’ E	1300	218
Lumeje	Moxico	11º 33’ S	20º 47’ E	1150	220
Luso	See: Luena	—	—	—	—
Malange	See: Malanje	—	—	—	—
Malanje / Rio Cuanza	Malanje	?	?	?	?
Malanje / Rio Lucala	Malanje	?	?	?	?
Mukoti	Huila	14º 12’ S	15º 48’ E	1430	320

Mumbué / Chitembo	Bié	13º 49' S	17º 19' E	1550	303
Muquitixe	Cuanza Sul	10º 25' S	14º 57' E	1240	147
Ndongo	See: Dongo	—	—	—	—
Negage	Uige	07º 46' S	15º 16' E	1260	59
Nova Lisboa	See: Huambo	—	—	—	—
Osi	See: Osse	—	—	—	—
Osse	Huila	15º 05' S	15º 25' E	1190	359
Panguila, Morro da Cal	Bengo	08º 42' S	13º 27' E	<50	89
Quima	Huambo	13º 23' S	15º 30' E	1580	279
Quiminha	Bengo	08º 58' S	13º 47' E	120	90
Quingles	See: Kinglês	—	—	—	—
Sacaála	See: Caála	—	—	—	—
Salazar	See: Dalatando	—	—	—	—
Sangevé	See: Sangueve	—	—	—	—
Sangueve	Huila	13º 53' S	15º 50' E	1640	300
Satchijamba / Chitembo	Bié	13º 45' S	17º 10' E	1580	303
Saurimo	Lunda Sul	09º 39' S	20º 24' E	1070	139
Silva Porto	See: Cuito	—	—	—	—
(Fazenda) Stª Cruz	Moxico	11º 46' S	20º 06' E	1280	219
Teixeira de Sousa	See: Luau	—	—	—	—
Tentativa	Bengo	08º 36' S	13º 36' E	<50	90
Tombole	Cuando-Cubango	14º 33' S	15º 32' E	1400	342
Tumbolé	See: Tombole	—	—	—	—
Tundavala	Huila	14º 50' S	13º 24' E	2200	335
Tyitunda	See: Chilunda	—	—	—	—
Vila Luso	See: Luena	—	—	—	—
Xa-Sengue	Lunda Norte	10º 27' S	18º3 1' E	1300	155

Taxonomic study

Precis octavia sesamus Trimen, 1883 (Figs. 1-4)

Material examined: BENGO: Panguila, Morro da Cal, VII-1957, 1 ♀ (CZ-2853). Quiminha, XII-1970, 1 ex (AF-NY690052). Tentativa, VIII-1971, 1 ex (AF-NY690054); IX-1971, 1 ex (AF-NY690056); XII-1971, 1 ex (AF-NY690058); II-1973, 2 ex (AF-NY690060, AF-NY690061). BIÉ: Mumbué / Chitembo, IV-2014, AS+RC 1 ♂ (BS-33359). Silva Porto, X-1957, EAU, 1 ♂ (CZ-2941). HUAMBO: Camenhe, XI-2015, AS+RC 1 ♂ (BS-34982). Chianga, II-1971, 1 ♂ (PC); I-1972, 1 ♂ (PC); III-1972, 1 ♂ (PC); IV-1972, 1 ♂ (PC); VII-1972, 3 ♂♂ (PC); III-1975, 1 ♂ (PC); V-1975, 1 ♂ (PC); VI-1975, 2 ♂♂ (PC); VII-1979, 1 ♂ (PC). Nova Lisboa, II-1964, 1 ♂ (NA); III-1964, 6 ♂♂, 1 ♀ (NA); IV-1964, 5 ♂♂, 2 ♀♀ (NA); V-1964, 4 ♂♂, 2 ♀♀ (NA); VI-1964, 3 ♂♂, 2 ♀♀ (NA); VII-1964, 2 ♂♂ (NA); XII-1964, 2 ♂♂ (NA); I-1965, 1 ♂, 1 ♀ (NA); III-1965, 1 ♂ (NA); IV-1965, 1 ♂, 1 ♀ (NA); V-1965, 1 ♂ (NA); VI-1965, 1 ♂ (NA); XII-1965, 1 ♀ (NA); I-1966, 1 ♂ (NA); II-1966, 1 ♂, 1 ♀ (NA); III-1966, 1 ♂ (NA); V-1967, 1 ♂, 1 ♀ (NA); VI-1967, 5 ♂♂, 1 ♀ (NA); VIII-1967, 1 ♂ (NA); I-1970, 2 ♂♂ (NA); II-1970, 9 ♂♂, 5 ♀♀ (NA); III-1970, 2 ♂♂, 1 ♀ (NA); IV-1970, 1 ♂ (NA); V-1970, 9 ♂♂, 7 ♀♀ (NA); VI-1970, 4 ♂♂ (NA); ?-1970, MM, 2 ♂♂, 1 ♀ (MUHNAC-5166-5168); I-1971, 14 ♂♂, 3 ♀♀ (NA); II-1971, 1 ♂, 1 ♀ (NA); III-1971, 1 ♀ (NA); I-1072, 1 ♂ (PC). Sacaála / Nova Lisboa, VII-1958, 3 ♀♀ (CZ-3053, CZ-3057). HUILA: Tundavala, VIII-1972, 1 ex (AF-NY5690059). CUANDO-CUBANGO: Longa, III-1960, 1 ♂ (CM). CUANZA NORTE: Golungo Alto?-1962, MM, 1 ♂ (MUHNAC-17331). CUANZA SUL: Amboiva, I-1963, 2 ♂♂ (BS-17092, BS-17093). Cela, VIII-1970, 1 ex (AF-NY590051). Fazenda Klein / Calulo, XII-2015, AS+RC 1♀ (BS-34983). Muquitixe, IV-1974,

1♂ (PC). Roça Chitonde, XI-1971, 1 ex (AF-NY590057). Cunjo to Amboiva, I/1963, 1 ♂ (BS-17094). LUANDA: Funda, XII-1969, 1 ex (AF-NY690050); XII-1970, 1 ex (AF-NY690053). MALANJE: Kinglês (Lombe to Calandula), XI-2015, AS+RC 1 ♀ (BS-34984). MOXICO: Calombe / Luso, XII-1962, EAU, 1 ♀ (CZ-3326). Lago 28 de Maio (Alto Zambeze), VII-1959, 1 ♀ (CZ-3205). Lumeje, II-1965, 1 ♂ (BS-17084); IV-1965, 19 ♂♂, 1 ♀ (BS-17069 to BS-17082, BS-17086 to BS-17091); V-1965, 1 ♀ (BS-17083). Teixeira de Sousa, III-1965, 1 ♀ (BS-17085). Vila Luso, EAU, IX-1957, 4 ♀♀ (CZ-2881, CZ-2883, CZ-2890); VI-1972, 1 ♀ (BS-17248). Further, the PC collection integrates 9 non-labelled Angolan ♂.

DRUCE (1875) informs that the species occurs in the country; BACELAR (1958b, as *P. o.* f. *natalensis* Str. and as *P. octavia* f. *amestris* - synonym correspondent to the WSF), assigns "Angola" and later (BACELAR, 1961) reports the Bié province without details; LADEIRO (1956, as *P. sesamus*) registers Bulla (Moxico), Bimbe, and (as *P. natalensis*) Malanje / Rio Lucala and Xa-Sengue; MONARD (1956) assigns Kalukembé and Kuvangu (DSF) and Kalukembé, Tyitunda, Sangevé and Ebanga (WSF, as *P. octavia natalensis*) plus Tumbolé, Bimbi and Elendé; GARDINER (2004, sub *Junonia*) adds the "Four corners area"; and WILLIS (2009) points material from the Estação Zootécnica da Huila and the Cristo Rei.

The species ranges from Angola, DRC, Uganda and Kenya to South Africa (Limpopo, Mpumalanga, North West Province, Gauteng, KwaZulu-Natal, Eastern Cape), Botswana and Namibia - AURIVILLIUS (1928), ACKERY *et al*. (1995), D'ABRERA (2004), WILLIAMS (2007b).

The Gaudy Commodore is known in damp woody areas with stones and in forest edges and the known host-plants belong to genera *Coloeus*, *Iboza*, *Plectranthus*, *Pycnostachis*, *Rabdosiella*, *Solenostemom* (Lamiaceae) and *Eriosema* (Fabaceae).

P. octavia is the commonest and widest distributed *Precis* in Angola being one of the most seasonally dimorphic species in the country. DSF and WSF co-exist at least in Lumeje (in April) and Huambo (in March and July) and in the Huambo the imagos fly all the year around, though they are more abundant in the middle rains. The name f. *sesamus* is often applied to the DSF and the name f. *natalensis* to the WSF. After COLLINS (2015), intermediate forms are known.

Precis ceryne ceryne (Boisduval, 1847) (Figs. 5-8)

Material examined: BIÉ: Ceilunga, IV-1072, 1 ♂ (PC). Mumbué / Chitendo, II/2014, AS+RC 1 ♂ (BS-34804). HUAMBO: Chianga, I-1972, 1 ♂ (PC); III-1972, 1 ♂ (PC); V-1972, 2 ♂♂ (PC); VII-1972, 1 ♂ (PC); III-1975, 1 ♂ (PC). Nova Lisboa, IV-1064, 2 ♂♂, 2 ♀♀ (NA); V-1964, 2 ♂♂, 2 ♀♀ (NA); VI-1964, 1 ♂ (NA); V-1965, 2 ♂♂ (NA); V-1966, 2 ♂♂ (NA); V-1967, 1 ♂ (NA); V-1968, 1 ♂ (PC); IV-1970, 1 ♀ (NA); V-1970, 1 ♀ (NA); ?-1970, MM, 1 ♂ (MUHNAC-5163); V-1972, 2 ♂♂ (PC). CUANZA SUL: Cela, III-1971, 1 ♂ (PC); III-1974, 1 ♂ (PC). MOXICO: Lago Dilolo, IX-1958, EAU, 2 ♂♂ (CZ-3075), 1 ♂ (CZ-3076), 1 ♂ 1ex (CZ-3078). Lumeje, IV-1965, 3 ♂♂ (BS-17516-17518); V-1965, 6 ♂♂ (BS-17520-17525). Teixeira de Sousa, III-1965, 1 ♂ (BS-17515). UIGE: Damba, VI-1962, 1 ♂ (BS-17513). Negage, III-1973, 2 ex (AF-NY690001-690002). The PC collection integrates also one non-labelled ♂.

DRUCE (1875), AURIVILLIUS (1928), BACELAR (1958b), FOX (1968) and LARSEN (2005) point the species for Angola though no precise locality is assigned. BACELAR (1961) registers the Bié province upon material said to have been deposited in the Luso's São Bento College-Lyceum, MONARD (1956) reported Kuvangu, Mukoti, Sangevé, Bimbi and Elendé and BACELAR (1958a) assigns Chiaca.

The species is known to fly in Angola, DRC, Kenya, Uganda, Swaziland, South Africa (Limpopo, Mpumalanga, North West Province, Gauteng, KwaZulu-Natal and Eastern Cape) and Ethiopia.

The Marsh Commodore occurs in swampy and marshy high areas and the known host-plants are species of *Coloeus*, *Platostema*, *Plectranthus*, *Pycnostachis* (Lamiaceae) and *Scabiosa* (Dipsacaceae).

One re-examined male from Buco Zau deposited in the CZ and identified by BACELAR (1956) as *P. ceryne* is, for true, a specimen of *Precis pelarga* (see ahead); the Chiaca material registered later (BACELAR, 1958a) is almost certainly lost as happened with the whole MB collection in the 1978 fire

(BACELAR, 1958b); their identification was never rectified, implying that the real presence of the species in Cabinda remains uncertain. The same must be stated about the Bié province and the (also disappeared?) only specimen assigned from there (BACELAR, 1961). The DSF is often known as f. *tukuoa* and the WSF as f. *ceryne*.

Precis antilope (Feisthamel, 1850) (Figs. 9-12)

Material examined: BENGO: Tentativa, VIII-1971, 1 ex (AF-NY68920). HUAMBO: Chianga, V-1072, 1 ♂ (PC); II-1975, 1 ♂ (PC). Nova Lisboa, V-1964, 1 ♂ (NA); V-1965, 1 ♂ (NA); V-1967, 1 ♂ (NA); I-1970, 1 ♀ (NA); V-1970, 5 ♂♂ (NA). Quima, XI-2015, AS+RC 1 ♂ (BS-34981). CUANZA SUL: Muquitixe, II-1971, 1 ♂ (PC). LUNDA SUL: Henrique de Carvalho, VIII-1962, 1♀ (BS-17694); IX-1963, MM, 1♂ (MUHNAC-17322). Two DSF ♂ with no locality and no date - numbered as 76 and 77 - integrates, further, the PC collection.

MONARD (1956) points the species to Osi and Ndongo. BACELAR (1961) assigns the Bié province unknown locality - upon material said to be in the Luso Lyceum. GARDINER (2004, sub *Junonia*) notices the Angolan "Four corners area".

P. antilope flies along almost all the Sub-Saharan Africa and SW Arabia.

The Darker Commodore occurs in sub-arid bush, savanna and Brachystegia wood, though it sometimes enters forest; the caterpillars are known in *Platostema* and *Plectrantum* species (Lamiaceae).

The studied samples were obtained all along the year. After BRAUN (2013) the species flies in Swaziland from December to March (rains and beginning of the dry season) while WILLIAMS (2007b) reports December to July for South Africa. The DSF and the WSF are often known, respectively, as f. *antilope* and f. *simia*.

Precis pelarga (Fabricius, 1775) (Figs. 13-16)

Material examined: BENGUELA: Ganda, VII-1956, 1 ♂ (PC). BIÉ: Satchijamba / Chitembo, XI/2014, AS+RC 1 ♀ (BS-33457); XI/2015 1 ♂ (BS-34980). CABINDA: Pathway to Lagoa do Gima, III-1972, 1 ♀ (PG-0151). CUANZA NORTE: Golungo Alto, ?-1962, MM, 2 ♂♂, 2 ♀♀ (MUHNAC-17325, 17327, 17329). CUANZA SUL: Calulo, III-1972, 1 ♂ (BS-17264). Fazenda Klein / Calulo, XII-2015, AS+RC 1 ♂ (BS-34985). Roça Chitonde, III-1972, 1 ♂ (BS-17261). LUNDA NORTE: Dundo, V-1946, CDA, 1 ♂ (CZ-803). MOXICO: Cameia, VIII-1958, EAU, 1 ♂ (CZ-3064). Fazenda Santa Cruz / Luso, X-1958, EAU, 1 ♂ (CZ-3037). Lumeje, V-1965, 1♂ (BS-17519). UIGE: Damba, VI-1962, 1 ♂ (BS-17512); VII-1962, 1 ♂ (BS-17514). The following NA samples obtained in Nova Lisboa, all representatives of the WSF, are also considered to enter the present species despite their genitalias could not be rectified: III-1964, 2 ♂♂, 1 ♀; IV-1964, 2 ♂♂, 1 ♀; V-1964, 8 ♂♂, 6 ♀♀; VI-1964, 2 ♂♂, 2 ♀♀; VII-1964, 1 ♂; IV-1965, 2 ♀♀; V-1965, 3 ♂♂, 1 ♀; V-1967, 1 ♂, 1 ♀; VIII-1967, 1 ♀; II-1970, 2 ♀♀; IV-1970, 1 ♂, 2 ♀♀; V-1970, 3 ♂♂, 3 ♀♀; VI-1970, 3 ♂♂, 1 ♀; II-1971, 1 ♂,1 ♀; III-1971, 1 ♂.

The species was noticed to Angola only once, for Malange / Rio Cuanza LADEIRO (1956).

The species known range extends from Senegal to Angola and to Ethiopia and BERGER (1981) reports relatively to the DRC that it occurs "pratiquement partout, mais moins abondant au Shaba".

The Fashion Commodore flies in forest, in dense Guinea savanna as well as in deciduous and *Brachystegia* woods; it may appear also in degraded biotopes as suburban gardens and the caterpillars feed usually on *Plectranthus* and *Solenostomum* (Lamiaceae) though they are also known on cacao - *Theobroma cacao* (Malvaceae).

The PG specimen from near the Lagoa do Gima was misidentified by its collector as *Precis tugela trimeni* - handmade label, never published.

LARSEN (1996) considers, due to their similarity, that *P. pelarga* includes two subspecies, *P. pelarga actia* (see next taxon) and *P. pelarga pelarga*, and notes that in Kenya they will interbreed but after KIELLAND (1990) they occur sympatrically in Tanzania and so, they certainly deserve a specific status; RICHARDSON (2013) based on Zambian populations, accepts also they shall belong to two independent species, and points morphological dissimilarities in the FWD dark maculation and in the

male genitalia though he considered that there is a lot of variation and some specimens are extremely difficult to identify.

P. pelarga and *P. actia* are considered as independent species; the studied individuals of the present species, almost all of the WSF (only the badly preserved Cameia male is a DSF), show the FW black dot in space 3 more or less eccentric (centred in *P. actia*) and only 2 spines exist at the valves apical area (3-4 spines in *P. actia*); further, no intermediate forms were ever observed. The DSF and the WSF are often known, respectively, as f. *leodice* and f. *pelarga*.

Precis actia Distant, 1880 (Figs. 17-18)

Material examined: CUANZA NORTE: Golungo Alto, ?-1962, MM, 2 ♂♂ (MUHNAC-17328, 17330). MOXICO: Lumeje, IV-1965, 3 ♂♂ (BS-17678/17680); V-1965, 5 ♂♂ (BS-17681/17685); VI-1965, 1 ♀ (BS-17686). Vila Luso, IX-1957, EAU, 1 ♀ (CZ-2881).

AURIVILLIUS (1928) assigns the species to Angola without details and BACELAR (1961) reports *P. actia* from an unknown locality in the Bié province upon 3 disappeared and never rectified said to have been deposited in the Luso college.

After AURIVILLIUS (1928), *P. actia* ranges from Angola to Nyasaland (today Malawi), Kenya and Tanzania; BERGER (1981) points Angola, Zambia, Zaire, Tanzania, Burundi, Rwanda, Uganda et Kenya and assigns its occurrence in the DRC as being rare in the Mongala and Kivu but common on the Kwango, Kasai, Sankuru, Lualaba and Haut-Shaba; and ACKERY *et al*. (1995), and WILLIAMS (2007b), detail W Mozambique, Zimbabwe, N Zambia, S DRC, Angola, Rwanda, Burundi, Malawi, Tanzania, Uganda and Kenya. No precise localities in Angola were ever reported.

Otherwise, KIELLAND (1990) doesn't consider *P. actia* to be present in Angola, reporting Zimbabwe, Zambia, S. Zaire, Malawi and Tanzania, D'ABRERA (2004), points Zimbabwe, Zambia, Shaba province of southern Zaire, Mozambique and Tanzania, and RICHARDSON (2013), notices Kenya and the DRC to Zimbabwe. As just noted relatively to the previous species, LARSEN (1996) considers the present taxon at the subspecies level, as *P. pelarga actia* Distant, 1880 and states that in Kenya they would interbreed with *P. pelarga pelarga* (Fabricius, 1775).

The Air Commodore is known mainly for Brachystegia woods and savanna, though it may also enter forest; the reported host-plants are *Platostema* spp. (Lamiaceae). The DSF is often known as f. *actia* and the WSF as f. *furcata* and none representative of f. *furcata* was observed in Angola. Further, intermediate forms between *P. pelarga* and *P. actia* were never seen in the country, not even close to Lumeje where both species were collected simultaneously in May 1965.

Precis sinuata sinuata Plötz, 1880 (Figs. 19-20)

Material examined: CABINDA: Buco Zau, V-1952, collected during the day, 1 ♀ (CZ-nn). MOXICO: Teixeira de Sousa, III-1965, 1 ♂ (BS-17526).

Only the re-examined Cabinda female assigned by BACELAR (1956) was previously known in Angola, where the species is, with no doubt, rare.

After ACKERY *et al*. (1995) and WILLIAMS (1997b) *P. sinuata* ranges from Sierra Leone to Cameroon, São Tomé, DRC, Rwanda, Burundi and part of East Africa, what means that the BACELAR (1956) species reference to Angola was unknown for them. *P. sinuata hecqui* Berger is known from the E DRC (Kivu), Uganda, Ruanda and Burundi (BERGER, 1981) and LARSEN (1996) points also it occurs in W Kenya.

The Wide-banded Commodore occurs in forest, forest margin, and woodland in hilly countries. LARSEN (2005) suggests that the host-plants may be the same as for *Precis tugela* and WILLIAMS (1997b) assigns *Platostoma* sp. (Lamiaceae). The DSF is often named f. *sinuata* and the WSF - the only one seen from Angola - is named f. *pelargoides*.

Precis rauana silvicola Schultze, 1916 (Figs. 21-22)

Material examined: UIGE: Béu, I-1962, 1 ♀ (BS-17527); II-1962, 1 ♂ (BS-17528) - both specimen representatives of the WSF.

The Montane Commodore is new to Angola, which seems to constitute its southernmost limit. It flies in forest, submontane forest, clearings and forest roads.

The subspecies was reported (D'ABRERA, 1980, 2004, ACKERY *et al.*, 1995, both as *P. rauana omissa* Rothschild, 1918) from Cameroon and W DRC; they point the nominate subspecies ranges in W Kenya and E Uganda and a third one, *P. rauana osborni* Holland, 1920, in W Uganda and E DRC. LARSEN (2005) assigns that the westernmost subspecies occurs from E Nigeria, Cameroon and Gabon to the DRC (Ubangi, Uele, Mai-Ndombe, Sankuru) and W Uganda - none of them consider Angola. The known host-plants are species of *Platostema* and of *Plectranthus* (Lamiaceae).

ACKERY *et al.* (1995) suggest that *Precis silvicola* Schultze, 1916 (considered under *Junonia*) shall correspond to a senior synonym of *P. rauana omissa* Rothschild, 1918, despite this one was described two years later. LARSEN (2005), correctly, notes that the name *P. rauana omissa* Rothschild, 1918 though commonly used for this subspecies, is not valid as it falls in the synonymy of *P. rauana silvicola* Schultz, 1916; he considers further, that *P. rauana osborni*, which he accepts as a morph not as a subspecies, is a synonym of the nominate subspecies. Previously, he recognized *Precis rauana kakamega* Carcasson, 1961 as another subjective synonym of the nominate subspecies, concluding that *P. rauana* remains known only by the nominate subspecies and by the present one (LARSEN, 1996).

***Precis larseni* Mendes, Bivar-de-Sousa, Vasconcelos & Lopes, sp. n.** (Figs. 23-32)

Material examined: Holotype: MOXICO: Lumeje, IV-1965, 1 ♂ DSF (BS-17687). Paratypes: HUAMBO: Chianga, V-1972, 1 ♂ DSF (PC); VII-1975, 1♂ DSF (PC). CUANZA NORTE: Golungo Alto, ?-1962, MM, 2 ♂♂, 1 ♀ DSF (MUHNAC-17324, 17328, 17330). MOXICO: As for the holotype, 1 ♂, 1 ♀ DSF (BS-17688-17689), 1 ♂ WSF (BS-17690); V-1965, 1 ♂ DSF (BS-17691); VIII-1965, 1 ♂ DSF (BS-17692). Teixeira de Sousa, II-1965, 1 ♂ WSF (BS-17693). All the types in the MUHNAC. Non-type material: HUAMBO: Nova Lisboa, IV-1964, 1 ♂, 4 ♀♀ (NA); V-1964, 1 ♂ (NA); VI-1964, 1 ♂, 1 ♀ (NA); VI-1965, 1 ♂, 1 ♀ (NA-); V-1970, 1 ♀ (NA).

Description: WL: ♂: 27-28.5 mm (DSF) and 23-29 mm (WSF); ♀: 30 mm (DSF). DSF with the FW clearly produced and acute at the level of M_1; in the WSF the apex is less angulated and much shorter. Wings margins dark brown and narrow. Post-discal light band wide, orange-ochreous in both, DSF and WSF, more or less, clearly angulated externally at level of the FW space M_2-M_3, its most apical area never strongly narrowed. V variable but always with a conspicuous dark line prolonged from the middle of the FW M_1 - rarely from the wing apex - to the extreme of the HW tail. Male genitalia (Figs. 29-32) typical to a *Precis* species due to the elongation of the saccus - much longer than the tegumen and uncus combined and to the valves shape, not gradually narrowed to the apex but with a quite visible bottleneck; there are two apical, sharp, similarly developed spines somewhat curved, the dorsal one oriented outwards and the ventral one inwards; the uncus is short and wide, almost parallel-sided and slightly shorter than the tegumen, with a wide apical indentation, the juxta well developed and the edeagus poorly arched, with conspicuous lateral teeth and not suddenly pointed apically.

Derivatio nominis: The new species is named after the recently deceased Danish entomologist Torben Bjørn Larsen (1944-2015) whose contribution towards the knowledge of the Afrotropical butterflies and skippers is quite unique. His short permanence with us in Lisbon the 2010 was a stimulus for the continuation of our research on the African Papilionoidea, mainly on those from Angola.

Discussion / Morphology: The seasonal dimorphism and the individual variability known in the *Precis* species already stressed by a number of authors (MCLEOD, 2007, relatively to *P. octavia*) make more difficult the diagnosis of *P. larseni* sp. n. relatively to *P. tugela*, eventually its most similar known species. However: (i) in the DSF, the FW acute apex at the level of M_1 is much longer in *P. tugela*; (ii) the blackish brown margin of the four wings is narrower in *P. larseni* sp. n., especially in the FW; (iii) the light post-discal band is always orange ochreous - no pinkish nor violaceous tint exist

- and it is wider in the new species; besides, it is externally much more clearly angulated at the level of the FW space M_2-M_3; and (iv) relatively to the male genitalia, the main differences concern the saccus length, the valves shape, especially in what the size of the two apical spines and their orientation are concerned, as well as the clearly less arched edeagus in *P. larseni* sp. n. - especially noticeable when compared with that of *P. tugela* (VAN SON, 1979: Fig. 81), the large spines and it's not especially acute terminal part.

Discussion / Taxonomy and geographical distribution: *P. tugela* Trimen, 1879 is, as just discussed, the species that under the morphological point of view shall be the closest relatively to *P. larseni* sp. n. It is known by several subspecies, though not all the authors agree with their validity.

Described from Natal, South Africa (TRIMEN, 1879) *P. tugela* nominate subspecies is known from southern, central-eastern and eastern Africa, from South Africa (Natal, Transvaal) to E DRC and Ethiopia; in the south-eastern Zimbabwe, it was assigned from Umtali (now, Mutare) to Mount Selinda (DICKSON & KROON, 1978). WILLIAMS (2007b) and WOODHALL (2005, sub *Junonia*) detail its occurrence in Swaziland and in South Africa – Limpopo Mpumalanga and KwaZulu-Natal; BRAUN (2013) simply points it ranges along E and S Africa, from Ethiopia to South Africa.

P. tugela aurorina (Butler, 1893) was described from Malawi (BUTLER, 1894) and reported further from Kenya, Tanzania and Ethiopia (D'ABRERA, 2004, sub *Junonia*). With base on the Kenyan fauna, LARSEN (1996) considers however it must be faced as a seasonal form - "a Kenyan wet-season form of a monotypical species"; DICKSON & KROON (1978), WOODHALL (2005) and WILLIS & WOODHALL (2010) - all sub *Junonia* - state the same based on the fauna of South African, though WILLIAMS (2007b) recovers its validity at the subspecies level.

P. tugela pyriformis (Butler, 1896), described from the Ruwenzori, (BUTLER, 1896) remains known from W Uganda, DRC (Kivu, Shaba, Lomami, Lualaba), Ruanda, Burundi and Zambia (ACKERY *et al*., 1995, sub *Junonia*) and BERGER (1981) details relatively to the DRC, the Central Kivu, Haut-Shaba, Haut-Lomami and Lualaba. Its presence in Zambia is noticed by WILLIAMS (2007b) who points several localities to which we now add the approximate latitude and longitude: Ikelenge (11º14'S; 24º16'E), Mwinilunga (11º 44'S; 24º 24'E), Solwezi (12º 11'S; 26º 23'E), Mufulira (12º 30'S; 28º 12'E), Danger Hill (indeterminate but ca 20 miles north from Mpika: 11º 50'S; 31º 30'E), and Kasama (10º 10'S; 31º 11'E); they all are in or close to Brachystegia wood areas (WILD & GRANDVAUX-BARBOSA, 1968).

P. tugela piryformis is, so, the known subspecies geographically closer to *Precis larseni* n. sp. We even hypothesize that part of the westernmost Zambian samples identified as *P. tugela piryformis* may belong to the species just described; indeed, the samples from Ikelenge and Mwinilunga were collected quite close to the northern part of the Moxico's Cazombo salient and that of Solwezi is also part of the Zambian North-western Province; all the remaining ones came from clearly eastwards, east from the Cooperbelt and from the Northern Provinces. The same must be stated relatively to BERGER (1981) *P. tugela pyriformis* from the Haut-Shaba and eventually from the S Haut Lomami provinces of DRC - the southernmost part of the former Katanga; indeed, these Zambian and Congolese samples are closer under the geographical point of view to Angola than from the remaining samples of *P. tugela pyriformis* known from those countries.

Biotope: The studied representatives of the new species were all obtained above 1000 m altitude in areas with "miombo" - mixed savanna with trees, *Brachystegia* woods and open forest margin (GRANDVAUX-BARBOSA, 1970; WILD & GRANDVAUX-BARBOSA, 1968). The African Leaf Commodore, Eared Commodore or African Leaf Butterfly, *Precis tugela*, was reported by LARSEN (1996) in Kenya to forest clearings and along roads but also in more open areas including agricultural fields and KIELLAND (1990) stressed it is common in Tanzania in forests and forest margins and that it may fly from 350 to 2500 m alt. (*P. tugela aurorina*) or from 800 to 2000 m alt. (*P. tugela piryformis*). WILLIS & WOODHALL (2010, sub *Junonia*) reports the nominate *Precis tugela* to occur in the afromontane forests of the South African eastern escarpment.

Known host-plants: The caterpillars remain non-described and the host-plants unknown.

Relatively to the probably close *P. tugela* WOODHALL (2005, as *Junonia*) reports *Englerastrum scandens* and *Plectranthus* sp. (Lamiaceae).

Precis coelestina Dewitz, 1879 (Figs. 33-34)

Material examined: UIGE: Damba, VII-1962, 2 ♂♂ (BS-17697, 17699); Id., VIII-1965, 1 ♂ (BS-17698).

The species flies along most of the inter-tropical Africa: Guinea, Sierra Leone, Nigeria, Cameroon, Central African Republic, Angola, DRC (Kinshasa, Kasai, Sankuru and Lualaba), Uganda, W Kenya, S Sudan, W Ethiopia and Somalia. After ACKERY *et al*. (1955) it was described from Angola as "Guinea, aus dem 10º S.B. zwischen 17 und 22º O.L. von Greenw". AURIVILLIUS (1928) and LARSEN (2005) notice also Angola though without precise location, a country from where it shall be quite uncommon.

The Ocellated Commodore is known to fly on secondary forest, forest margins and clearings in hilly country and the caterpillars' host-plants remain unknown.

Precis archesia (Cramer, 1779) (Figs. 35-42)

Material examined: BIÉ: Silva Porto, X-1957, 1 ♀ (CZ-2941); X-1974, 1 ♂ (PC). HUAMBO: Chianga, I-1972, 1 ♂ (PC); III-1972, 1 ♂ (PC); IV-1972, 1 ♂ (PC); V-1072, 3 ♂♂, 1 ♀ (PC); VII-1972, 2 ♂♂ (PC); IV-1973, 1 ♂ (PC); II-1975, 1 ♂ (PC); V-1974, 1 ♂ (PC); VI-1075, 1 ♂ (PC). Nova Lisboa, IV-1964, 3 ♂♂ (NA); IV-1956, 2 ♀♀ (NA); V-1965, 3 ♂♂, 1 ♀ (NA); VI-1965, 2 ♂♂, 1 ♀ (NA); III-1970, 1 ♂ (NA); ?-1970, 2 ♂♂, MM, (MUHNAC-5169, 5172). HUILA: Humpata, I-1975, 1 ♂ (PC). Tundavala, VIII-1970, 1ex (AF-NY689050). CUANZA NORTE: Salazar, III-1975, 1♂ (PC). MOXICO: Lumeje, IV-1965, 6 ♂♂, 1 ♀ (BS-17700-17701, 17703-17707); V-1965, 1 ♀ (BS-17708). Teixeira de Sousa, II-1965, 1 ♂ (BS-17702). Vila Luso, IX-1957, EAU, 1 ♂ (CZ-2883). UIGE: Damba, XI-1961, 2 ♂♂ (BS-17695-17696). One non-labelled WSF ♂ with the number 1038 integrates, further, the PC collection.

DRUCE (1875) reports the species from Banana / Angola, a locality which is actually in the right margin of the River Zaire mouth, today DRC, not Angola. AURIVILLIUS (1928) assigns Angola, BACELAR (1961) the Bié province and GARDINER (2004, sub *Junonia*) the Angolan "Four corners area"; WILLIS (2009) is the only one to point a precise location in Angola, the Estação Zootécnica (the Zoo-technical Research Station) in the edge of the Huila province escarpment.

The subspecies is known from Angola, Botswana, Zambia, S DRC, Kenya, Swaziland and South Africa (Limpopo, North-west province, Gauteng, KwaZulu-Natal, Eastern Cape and Western Cape).

The Garden Inspector or Garden Commodore flies in rocky areas in grassland and savanna, *Brachystegia* woodland and other forested edges; the known host-plants are species of *Plectranthus*, *Pycnostachys*, *Rabdosiella* and *Solenostomum* (Lamiaceae).

The sample obtained in April 1965 in the Lumeje integrates representatives of the WSF - their majority - but also of the DSF and the two seasonal forms were obtained simultaneously in Chianga, the July 1972. Despite considered by WILLIAMS (2007b) as including two subspecies, the nominate one and *P. archesia ugandensis* (McLeod, 1980) from Sudan and Uganda, it is here considered a monotypical species according with LARSEN (1996) among others. The DSF is often nominated f. *archesia* and the WSF f. *pelasgis*.

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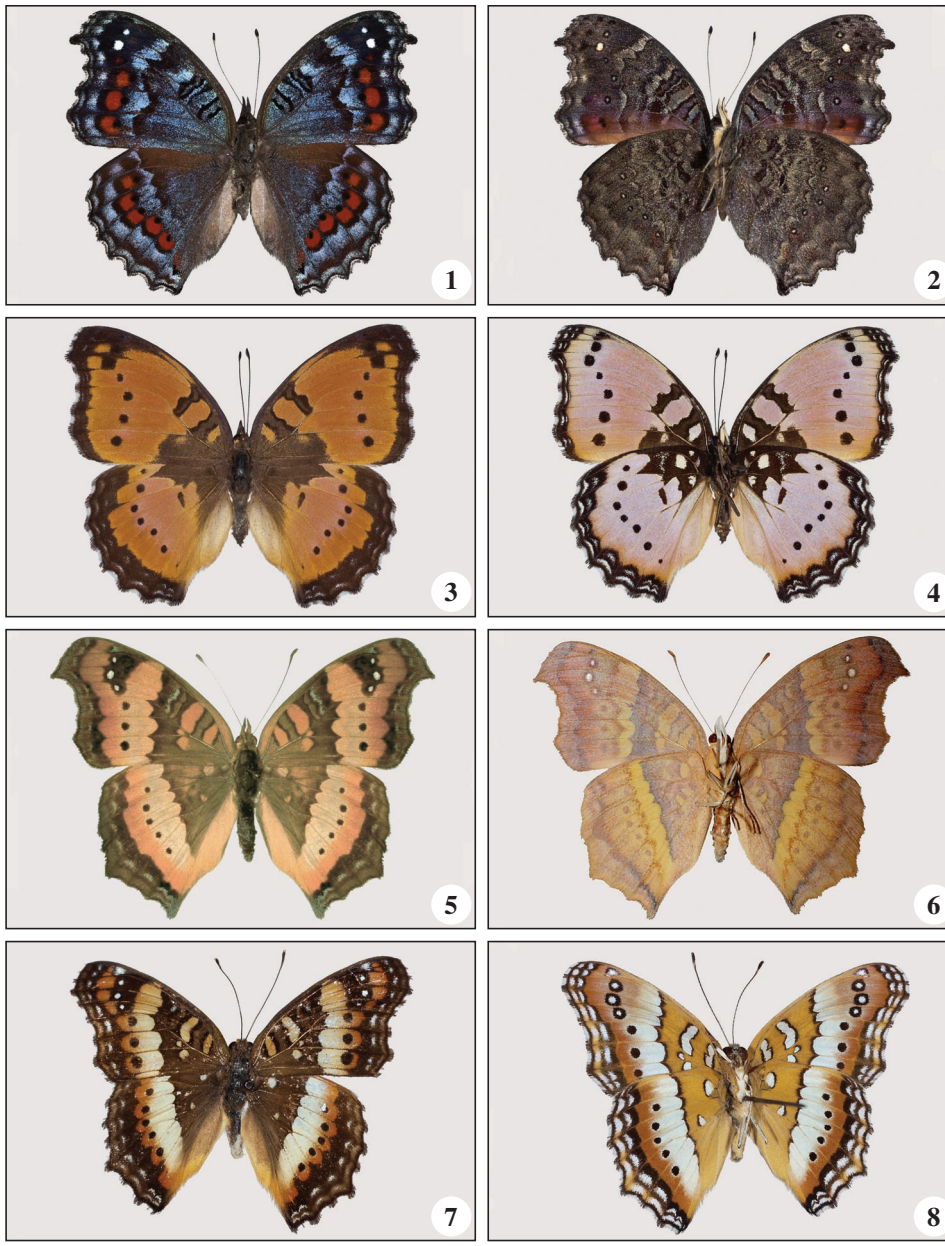
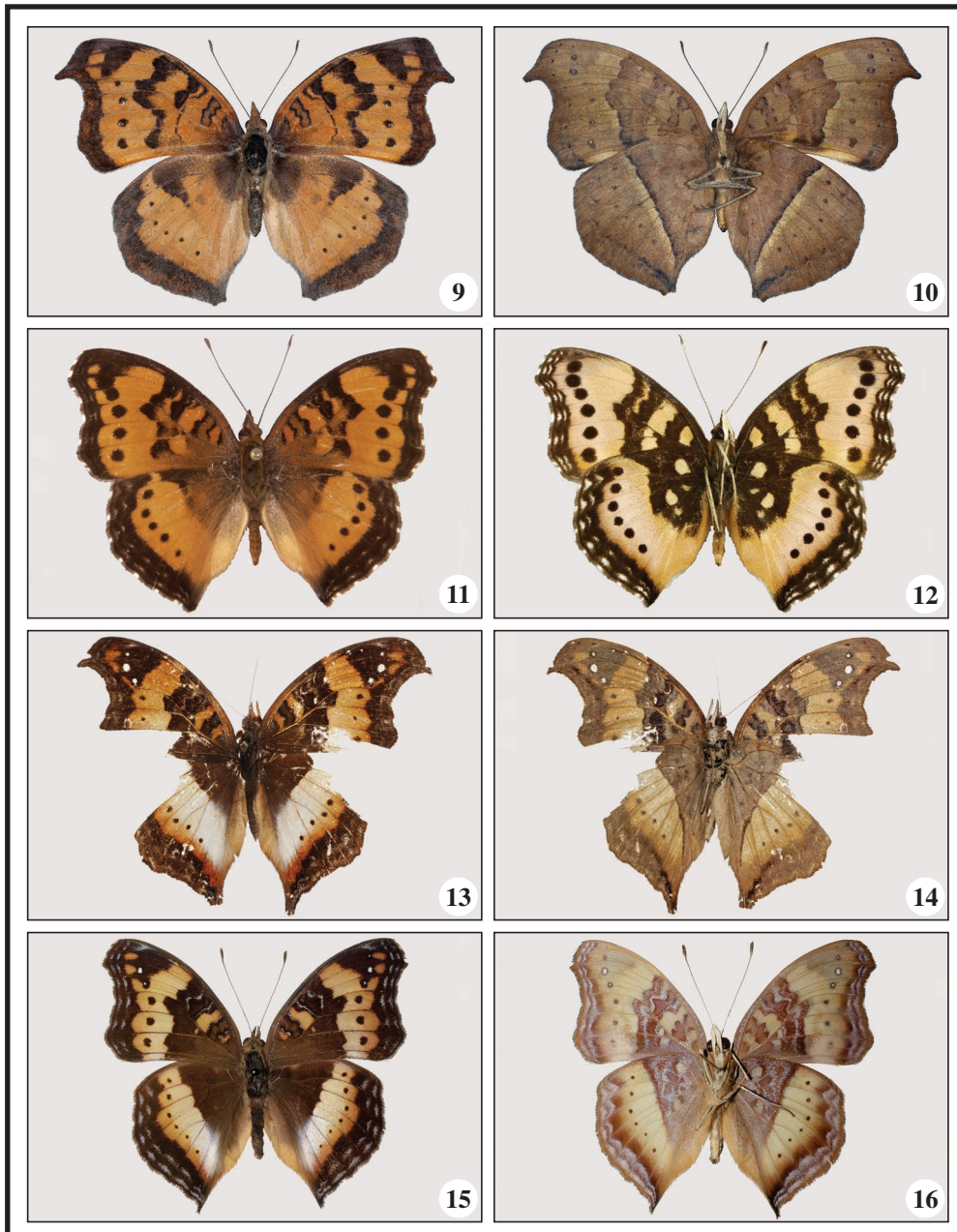


Figs. 1-8.– 1-4. *Precis octavia sesamus* Trimen, 1883. **1.** ♂ (BS-17076), DSF (f. *sesamus*) from Lumeje, dorsal. **2.** Id, ventral. **3.** ♂ (BS-17074), WSF (f. *natalensis*) from Lumeje, dorsal. **4.** Id, ventral. **5-8.** *Precis ceryne ceryne* (Boisduval, 1847). **5.** ♂ (BS-17521), DSF (f. *tukuoa*) from Lumeje, dorsal. **6.** Id., ventral. **7.** ♂ (BS-17515), WSF (f. *ceryne*), from Teixeira de Sousa, dorsal. **8.** Id, ventral.



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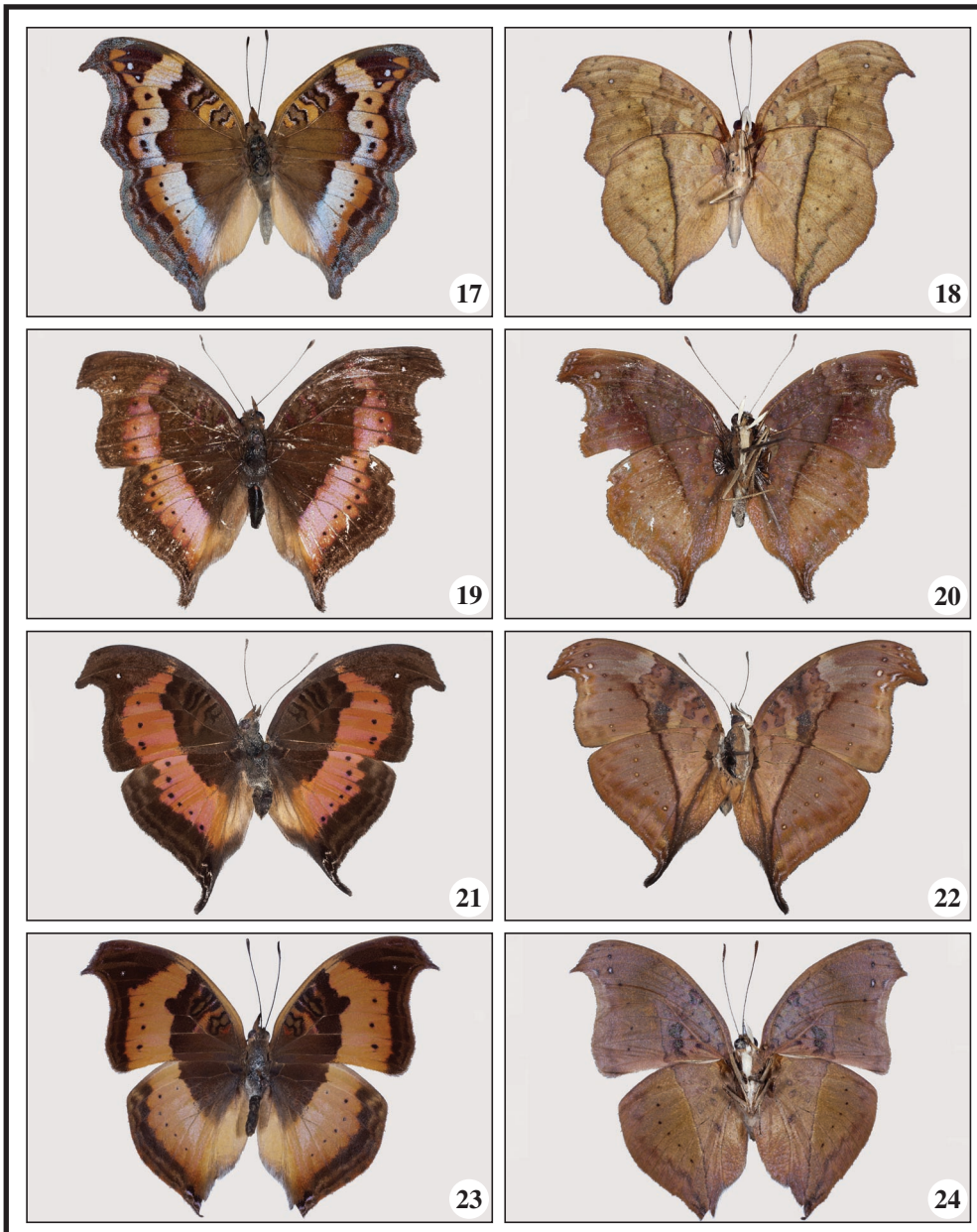

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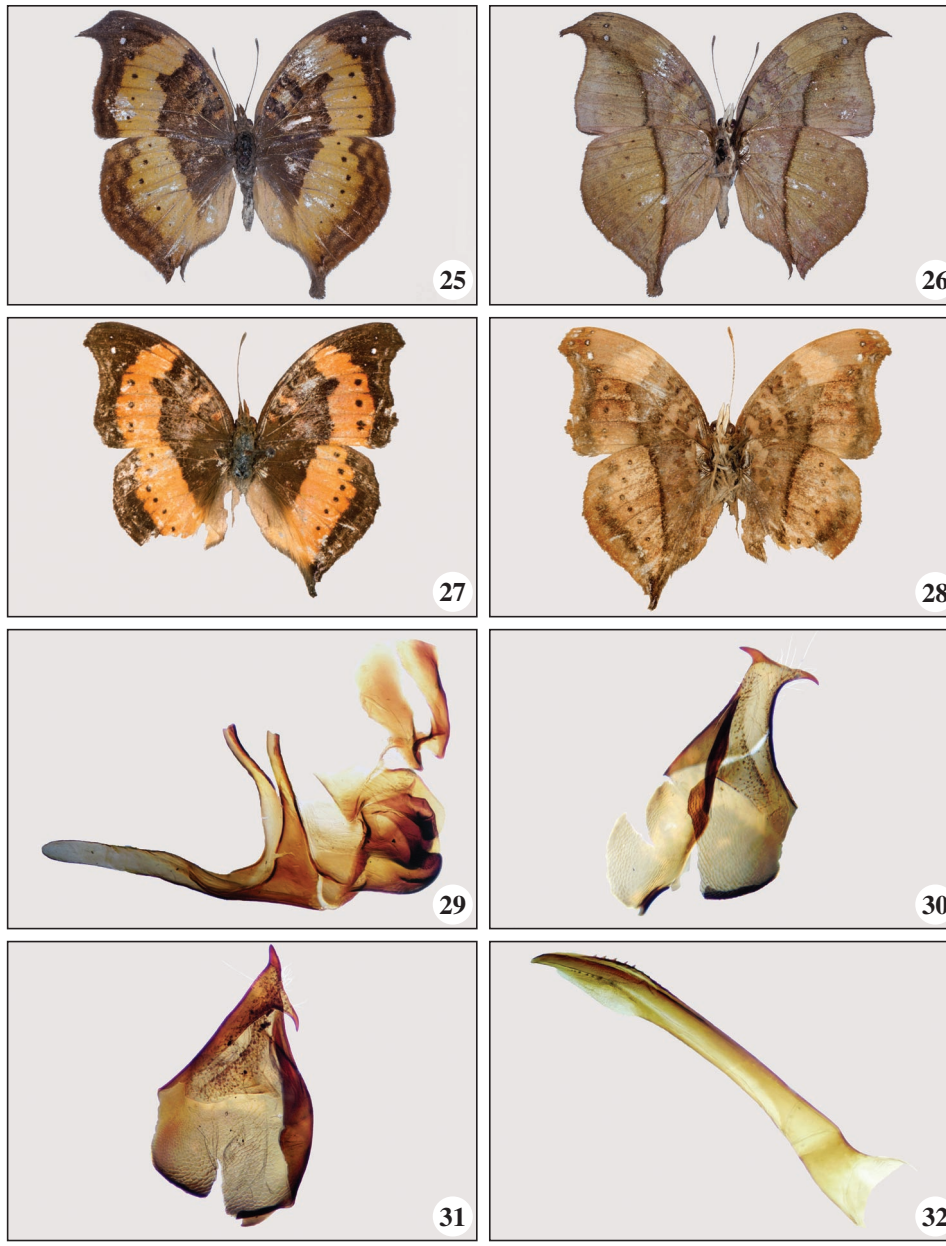
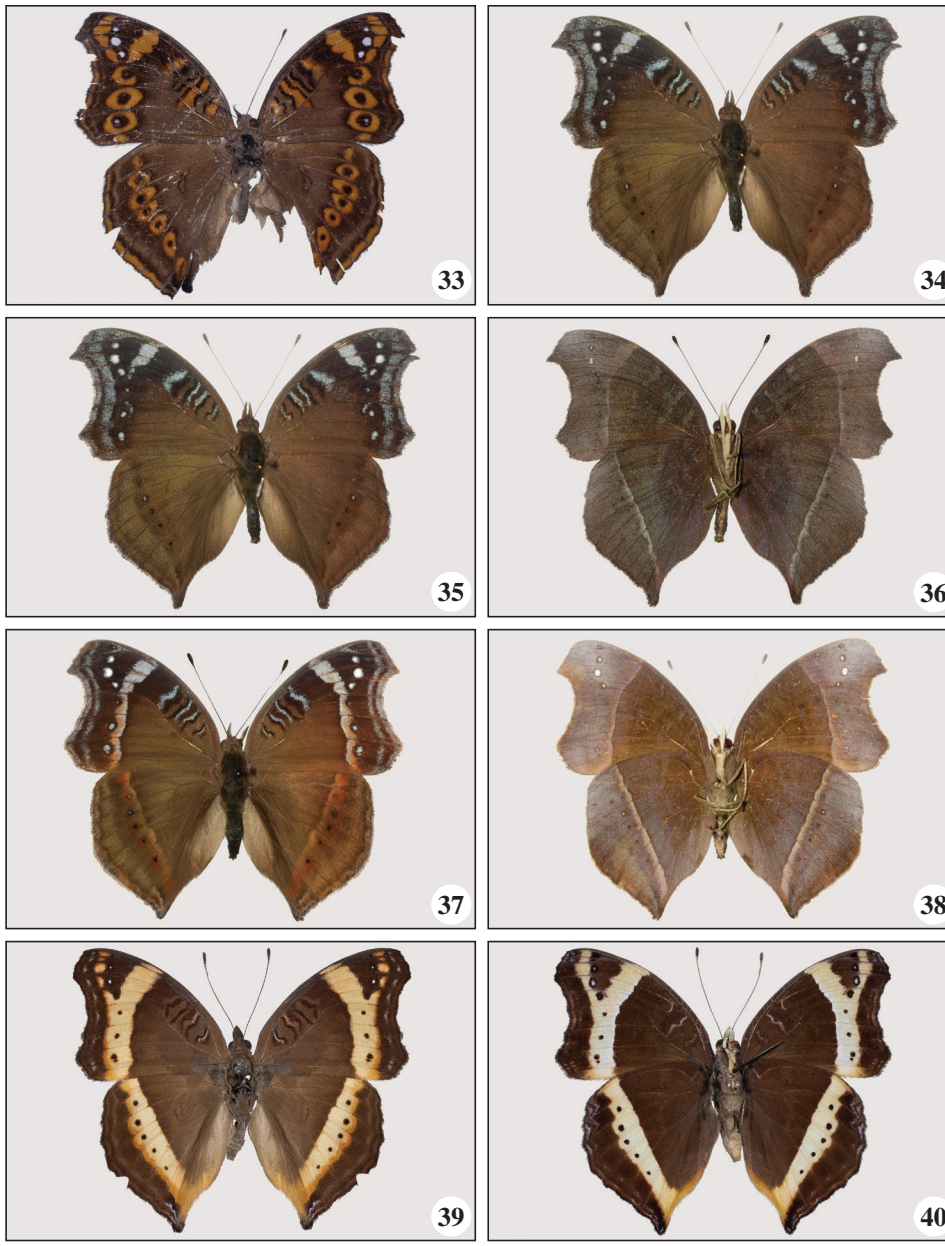


Figs. 25-32.– *Precis larseni* Mendes, Bivar-de-Sousa & Vasconcelos sp. n. **23.** (♂ holotype - BS-17687), DSF from Béu, dorsal. **24**. Id, ventral. **25.** (♀ paratype - BS-17688), DSF from Lumeje, dorsal. **26.** Id, ventral. **27.** (♂ paratype - BS-17690) from Teixeira de Sousa, WSF, dorsal. **28.** Id, ventral. **29.** Male genitalia: saccus, part of vinculum, juxta and uncus. **30.** Id, valva. 31. The other valva. **32.** Id, edeagus.



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Figs. 41-42.– *Precis archesia archesia* (Cramer, 1779). **41.** (♀ - BS-17708), WSF (f. *pelasgis*) from Lumeje, dorsal. **42.** Id, ventral.